AirStation G54

54Mbps Wireless Compact Repeater Bridge-g
User Manual
WLA2-G54

INTRODUCTION

1.1 AirStation 54Mbps Compact Repeater Bridge (WLA2-G54)

This User Manual introduces you to the High-Speed AirStation 54Mbps Compact Repeater Bridge and will assist you with the more advanced features of the product.

The AirStation 54Mbps Compact Repeater Bridge ,WLA2-G54, is a wireless network access point that can be added to an existing network (LAN) to create a wireless network or added to an existing WLAN to extend the range of the WLAN. The WLA2-G54 complies with the IEEE 802.11g wireless standard and is interoperable with the IEEE 802.11b wireless standard. IEEE 802.11g technology features longer range than IEEE 802.11a and greater bandwidth with data rates up to 54 Mbps in the turbo mode. The WLA2-G54 supports Wi-Fi Protected Access™, AES, 802.1x and WEP for security. The WLA2-G54 supports the Wireless Distribution System (WDS) and can be used as a multi-functional bridge/link between wired and wireless LANs. The WLA2-G54 has a built-in 10/100M 4-port switch to incorporate features of wired and wireless networking environments.

1.2 AirStation Wireless Network Features

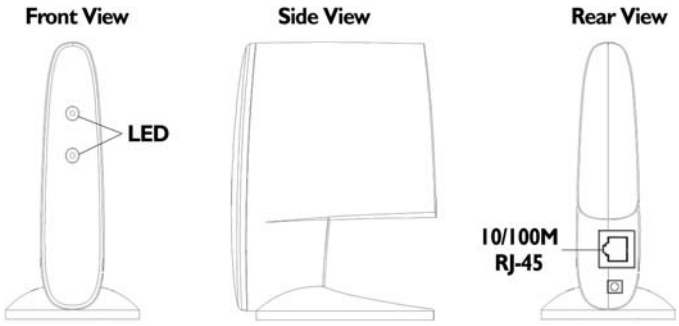
Summary of the AirStation WLA2-G54 features:

- Wi-Fi™ (Wireless Fidelity) certified AirStation will communicate with other Wi-Fi compliant 802.11g wireless LAN products.
- Wi-Fi Protected Access™ (WPA), AES, 802.1x and WEP for protecting data.
- Automatic Transmit Rate Select mechanism transmits at speeds of 24, 12, 11, 5.5, 2 and 1 Mbps.
- Supports turbo mode of 36, 48 and up to 54 Mbps.
- Wireless Ditribution System (WDS) support for multi-point communication.
- Ability to set a fixed data rate for faster than 11Mbps ignoring 802.11b legacy devices.
- Auto roaming, supports seamless roaming over multiple channels.
- Auto VPN setup, for secure communications.
- Wi-Fi Protected Access™ support.
- EAP-TLS, expanding the 802.1x authentication method.
- Up to 128bit Wired Equivalent Privacy (WEP) data encryption.
- Packet Filtering for eliminating unwanted communications.
- Syslog transmits some or all system activities to a central Syslog server.
- Extended range, with optional add-on 2.4Ghz antennas.
- Auto Media Dependent Interface/Crossover (MDI/X) port, allows connection by standard and crossover CAT5 cables.
- Supports Universal Plug and Play (UPnP).
- Optional external 2.4 GHz antennas for boosting range and signal quality.
- Improved resistance to environmental conditions.

1.3 AirStation 54Mbps Compact Repeater Bridge Package

The AirStation WLA2-G54 package consists of the following items.

1. WLA2-G54
2. AC adapter with Int'l Adapters
3. CAT5 straight cable
4. Quick Setup Guides (Mac & PC)
5. WLA2-G54 Utility CD with Manuals
7. Warranty Statement



1.5 About the AirStation CD

Prior to copying or installing the software, please read the Software License Agreement "license.txt", located in the root folder of the CD. By installing, copying or using the AirStation software, you are consenting to the terms of this agreement. If you do not agree to all of the terms of the Software License Agreement, do not download, copy or install the AirStation software.

It is the policy of Buffalo Technology to improve products as new technology, components, software and firmware become available.

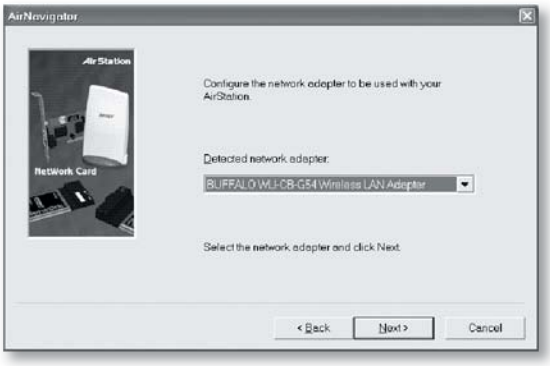
Before you proceed with the installation of this product, please consult the Buffalo website (**http://www.buffalotech.com**) to download and install the latest software for your product.

BASIC SETUP

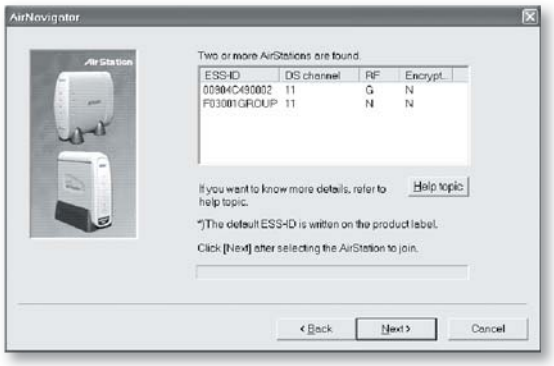
2.1 Using AirNavigator For easy setup, the WLA2-G54 CD contains a web-based utility, AirNavigator. Use it to set up the wireless LAN environment for both AP and PC (client). The system requires Explorer 4.0 or higher, or Netscape Communicator 4.0 or higher.

To set up the parameters manually, refer to Chapter 3. Before installation, verify the PC is set up for browsing the Internet.

1. Insert the AirNavigator CD into the CD drive. The following screen will appear. For AirStation setup, select "Setup the AirStation" and click **OK**.



2. The Network Adapter confirmation screen will appear. Verify the adapter shown matches that of the PC.



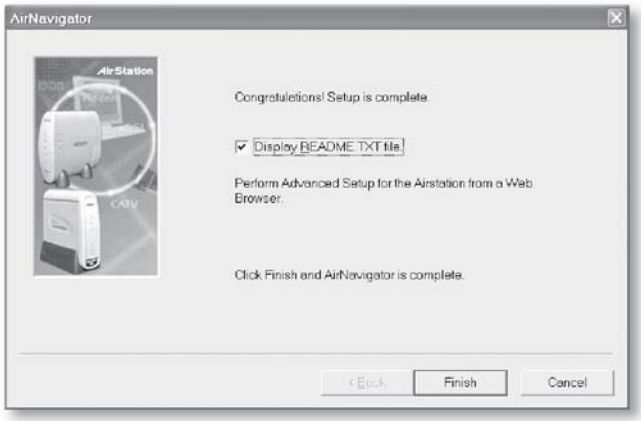
3. Click **Next** until a list of available access points shows up in the ESS-ID field. Buffalo's ESS-ID is 12 digits and is found on the back of the AirStation, labeled LAN MAC Address. Select the one you want to communicate with and highlight it. Click **Next**.

4. If the client IP range is different than the default AirStation IP of 192.168.11.1, an IP configuration screen will appear next. Select **Automatically set up the IP address,** or **Specify an IP address for manual setup.**

5. A login screen will appear.

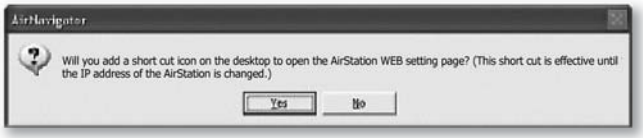
- Enter "root" as the User name.
- Leave the Password box blank (do not enter anything into the Password box) and click **OK**.

If the following screen is shown, connection to the WLA2-G54 is complete.



If the following screen is shown, connection to the WLA2-G54 is complete.

6. Click **Finish**.



7. To place a shortcut icon on the desktop, click **Yes**. Otherwise, click **No**.

STANDARD SETTINGS

3.1 Introduction

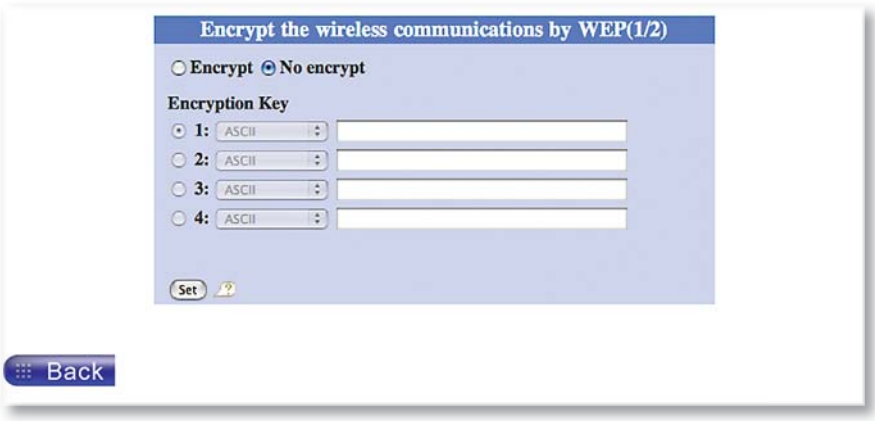
Setting up the AirStation parameters using a Web Browser requires basic wireless configuration knowledge. For Advanced settings and explanations of each parameter and its use, see **Chapter 4.**

3.2 Setup Overview

The WLA2-G54 is configured to function right out of the box. Simple settings for security and MAC Address registration are offered in this section- Specialized setups for security, filtering and other features will be explained in later sections by clicking the **Advanced** Button.

3.3 Open the Setup Screen

- Click WEP to enter simple WEP setting to protect your wireless data.



Select **WEP** to input a password or encryption code to protect wireless communications. It is possible to enter up to 4 different WEPs. The WEP key must match between two parties for secure communications.

Examples of WEP key:

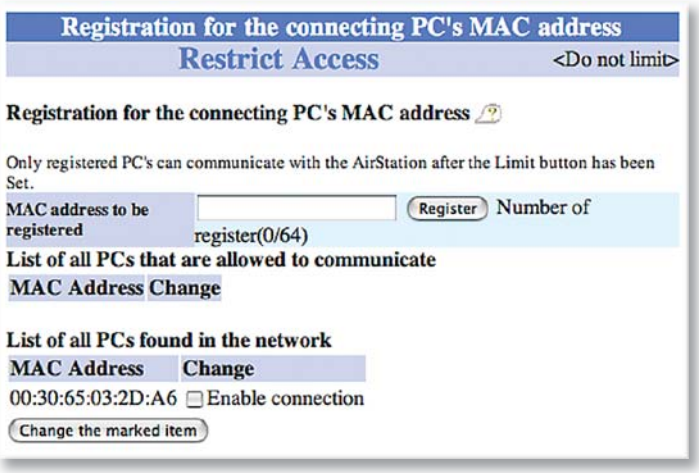
64bit ASCII: 5 digits of alphanumeric characters, "ab34Y"

128bit ASCII: 13 digits of alphanumeric characters, "123456abcdef7"

■ Note: ASCII WEP is case sensitive.

64bit HEX: 10 digits, using characters 0-9 and a-f, "00234ABCDE"

128bit HEX: 26 digits, using characters 0-9 and a-f, "20123456789abcdeabcdeabcde"



Register for allowable PC's MAC address - MAC access restriction set up in LAN. Input the MAC addresses that is to be allowed to communicate.

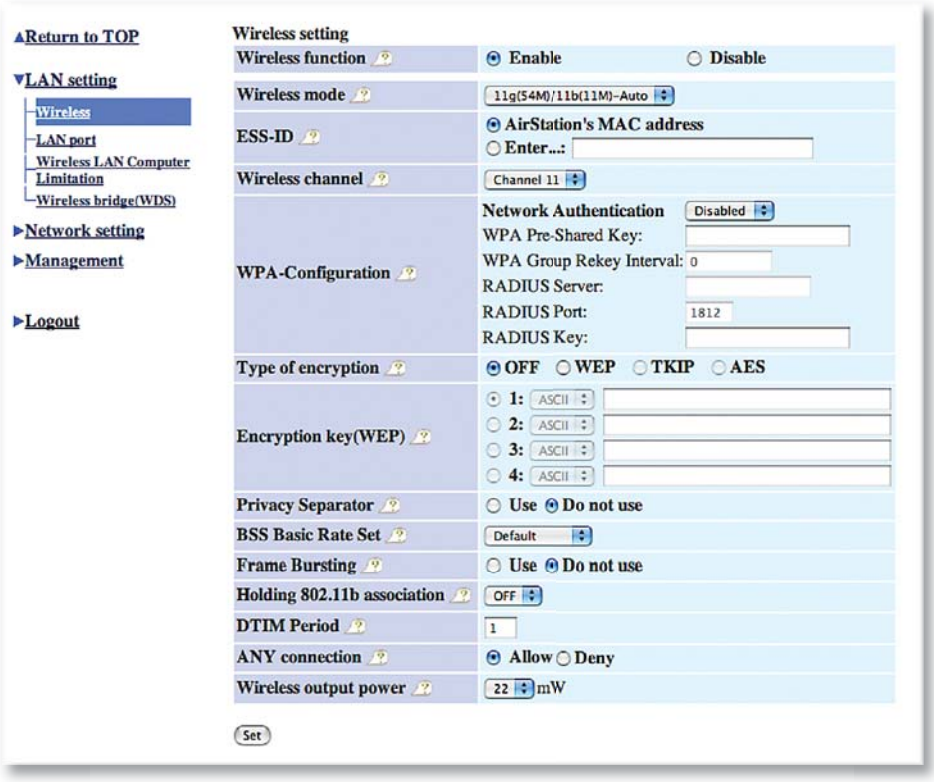
MAC address list - Display a table list of all MAC addresses.

USING AIRSTATION FOR ADVANCED CONFIGURATIONS

Although your AirStation will function fine using only the settings from Section 3, you may wish to explore more advanced options. This chapter explains each parameter in the **Advanced** button. Click the **Top tab** and click the **Advanced** button.

4.1 LAN Setting

4.1.1 Wireless



Wireless function - Enable or disable wireless communication

Wireless Mode - Select one of the following:

11g(54M)/11b(11M)-Auto - Allows communication of 11g and 11b devices. Communication speed will drop to 11Mbps when 11b devices are connected.

11g(54M)-Turbo - Boosts 11g devices to turbo 54Mbps mode.

11g(54M)-Only - 11g devices will be able to communicate, but not 11b devices.

ESS-ID - Allows administrator to alter the ESS-ID of the AirStation. Default ESS-ID is the LAN MAC Address. To communicate with a specific AP only, the AP's ESS-ID must be entered in the client PC. The client PC looks for the specific AP (or ESS-ID) for wireless communication. Use up to 32 alphanumeric characters for the ESS-ID (case sensitive).

■ Note: **Roaming** - When multiple AirStations have an identical ESS-ID, WEP, and DS channel, client PCs may Roam between the AirStations.

Wireless Channel - Select the channel used for wireless communication. There are 11 overlapping channels. Channels 1, 6 and 11 are non-overlapping.

If there are multiple APs in close proximity using the same channel, there may be interference. In this case, change to a non-overlapping channel.

■ Note: This parameter is automatically set in the client computer.

WPA Configuration - Configure WPA(Wi-Fi Protected Access) setting. Do not use the WPA function if the WEP encryption is selected from "Type of encryption" field.

802.1X

Use 802.1x authorization. Clients authorized by RADIUS servers can access this AirStation. RADIUS Server, RADIUS Port and RADIUS Key should be entered. You can also use secure communication selecting WEP encryption from "Type of encryption" field.

WPA

Authorized client by RADIUS server can access this AirStation. RADIUS Server, RADIUS Port and RADIUS Key should be entered. You should select either TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption Standard) from "Type of encryption" field.

WPA-PSK

Clients access this AirStation by PSK (Pre-Shared Key) without RADIUS authorization. You should select either TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption Standard) from "Type of encryption" field.

Examples of WPA key:

WPA-PSK (Pre-Shared Key) must be composed of at least 8 characters, but no more then 63 characters. The following are acceptable characters for a WPA-PSK key:

Upper case letters, lower case letters, numbers, spaces, punctuation <>?=+&%

WPA-PSK Key Example: "This is <1> example of a WPA Key"

Note: WPA keys are case sensitive.

Type of Encryption - Select Off, WEP, TKIP or AES

If **WEP** is selected, create and enter an encryption code to protect wireless communications. It is possible to enter up to 4 different WEPs. The WEP key must match between two parties for secure communications.

Examples of WEP key:

64bit ASCII: 5 digits of alphanumeric characters, "ab34Y"

128bit ASCII: 13 digits of alphanumeric characters, "123456abcdef7"

■ Note: ASCII WEP is case sensitive.

64bit HEX: 10 digits, using characters 0-9 and a-f, "00234ABCDE"

128bit HEX: 26 digits, using characters 0-9 and a-f, "20123456789abcdeabcdeabcde"

Privacy Seperator - Select Use or do not use to block communication between each wireless LAN PC on the wireless network. If you choose to use, every wireless LAN PCs that is associated to the same AirStation can not communicate with each other. Even if this function is used, wired LAN PCs can communicate with wireless LAN PCs.

BSBasic Service Set) Basic Rate Set - The transmission data rate between devices. If one device supports 2Mbps only, the data rate for the entire network should be limited to 2Mbps ("Default" selection). Otherwise, use 11Mbps max ("All" selection).

Frame Bursting - Increase IEEE802.11g communication throughput by transferring packets continuously. However, the following condition effects this function. The client wireless LAN adapter must support Frame Bursting feature too. When multiple wireless clients use Frame Bursting feature, the throughput might not increase

Holding 802.11b Association - When this function is enabled, the AirStation requests IEEE802.11b devices to stop communication for a while prior to starting IEEE802.11g communication. If communication speed is decreased, this setting improves total throughput with existing IEEE802.11g and IEEE802.11b standard devices,. The throughput decreases if only IEEE802.11g standard devices exists.

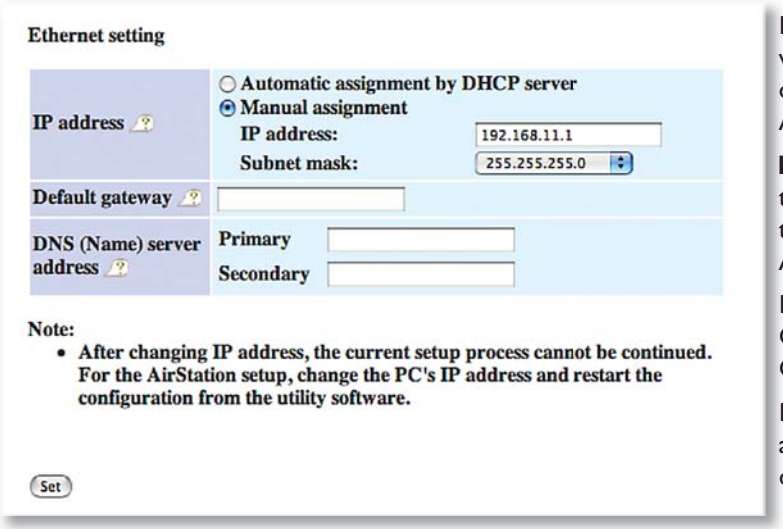
DTIM Period - An transmits beacon signals to nearby clients at a preset interval. This parameter sets the beacon transmission interval time (1-255 sec.). Selection of a larger number may conserve energy for the client PC (when client power management is enabled), but may delay wireless communication. The default value of 1 is recommended.

ANY Connection - The AirStation can be configured to accept connections from any wireless client using an ESS-ID of "ANY". Roaming wireless clients will automatically connect to the nearest access point accepting ANY connections. The only options are to allow or deny connections for these types of clients, thus, wireless networks requiring security should mandate a WEP encryption policy to preserve security if ANY connections are allowed. If Deny is selected under the the "ANY Connection," SSID of the AirStation will not be broadcast and users will not be able to connect to the WLA2-G54 unless the specific ESS-ID is entered in the client PC.

Wireless Output Power - Adjust the power ouput power of the radio.

4.1.2 LAN port

Set LAN interface parameters.



LAN Side IP address - Allows administrator to select whether AirStation is assigned an IP address by a DHCP server or specify a static IP and Subnet Mask for the LAN side of the AirStation.

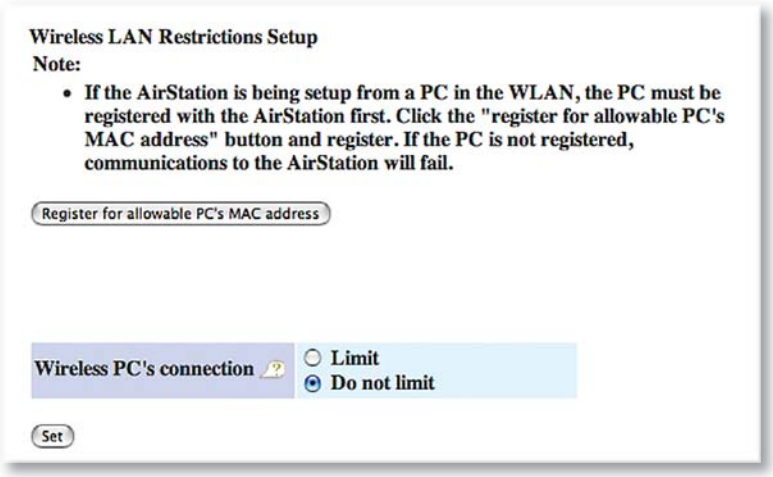
■ Note: If the AP's IP address is changed to a different range, the setting PC's IP must be changed to the same range to continue configuration. Then restart the setup session from the AirStation utility screen.

Default Gateway - Allows administrator to use the Default Gateway address (the AirStation's IP address), assign a specific Gateway address, or block clients from Gateway notification.

DNS server - Allows administrator to use the default DNS address (the AirStation's IP address), assign specific DNS addresses, or block clients from DNS address notification.

4.1.4 Wireless LAN Computer Limitation

This option limits the PCs allowed a wireless connection to the AirStation. It is used to control the wireless connections to the AirStation.



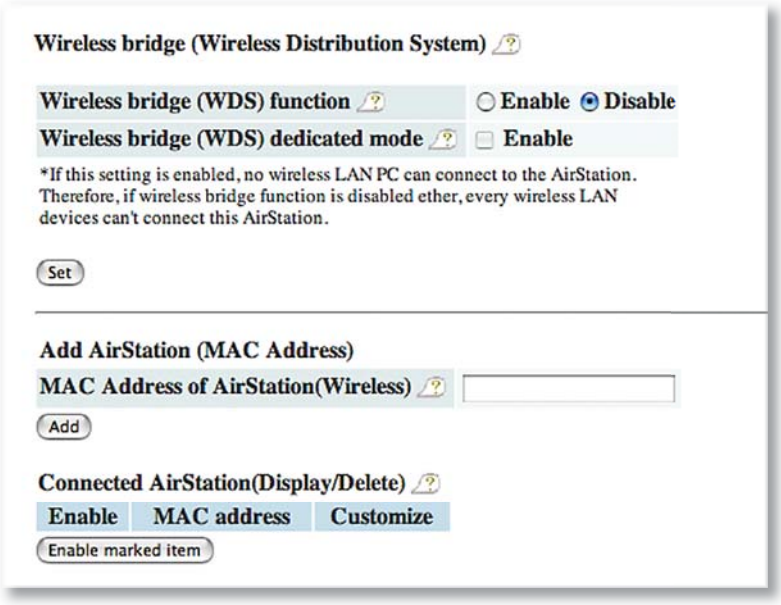
Wireless PC's Connection - Select Limit to restrict the connection and Do not Limit for open access. Register your client PC's MAC address before selecting Set.

Register for allowable PC's MAC address - MAC access restriction set up in LAN. Input the MAC addresses that to be allowed to communicate.

MAC address list - Display a table list of all MAC addresses.

4.1.5 Wireless Bridge (WDS)

Wireless Distribution System allows the wireless connection of access points to extend a wiredor wireless infrastructure to locations where cabling is not possible or too expensive to implement.



Wireless bridge (WDS) function: Select **Enable** to allow WDS mode between AirStations or **Disable** to block communication between AirStations.

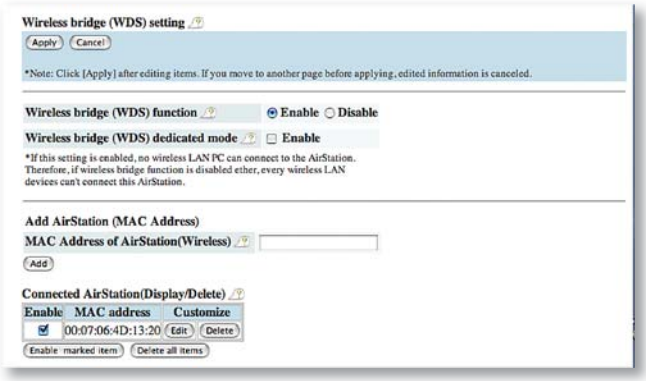
Wireless bridge (WDS)dedicated mode: Select Enable to disable wireless PCs from communicating with the AirStation.

■ Note: Both AirStations must support WDS to communicate with each other. WDS process must be repeated with other bridge access points. Example: AP1 MAC Address is entered into AP2; AP2 MAC Address is entered into AP1;

Add AirStation (MAC Address): Allows administrator to register the wireless MAC address of AirStations for (WDS) point-to-point or point-to multipoint communication between AirStations. The MAC address to enter is found in the Management section, under System Information/ Wireless MAC address section. The WDS function must be set to **Enable**. The MAC address is 12 characters long.

Enter the Wireless MAC address in the form of two characters separated by a colon and click **Add**. Up to six sets may be registered.

Connected AirStation (Display/Delete):



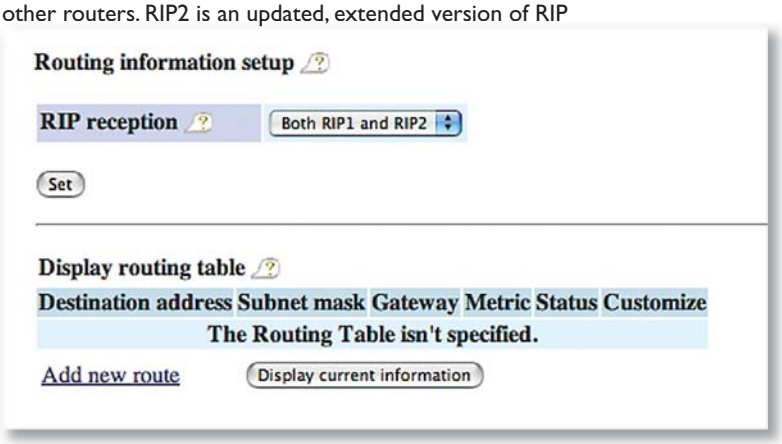
Once settings have been added to the WDS configuration screen, the MAC Address of associated Access Point(s) will be displayed.
Click Apply to confirm settings.

4.2 Network Setting

4.2.1 Routing Setup - Routing is not functional with the AirStation Bridge

Routing is the path data packets take between devices on the network.
A route is governed by the routing table, a copy of which exists on each network device.
If the device you are trying to communicate with does not exist on the network, the data packet is sent to the default gateway to look outside the network for the device.

The Routing Information Protocol (RIP, also called RIP1) is used to exchange data between routers.
Similarly, if you allow the AirStation to receive RIP information, the AirStation's routing table will incorporate the information it receives from the other routers. RIP2 is an updated, extended version of RIP

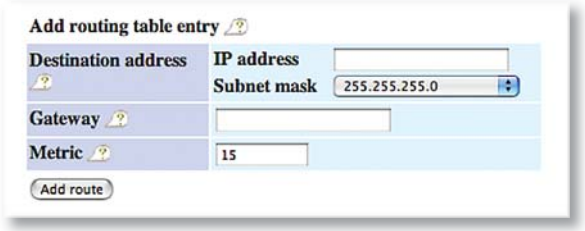


RIP reception - This determines the type of RIP information to receive.

Select None, RIP1, RIP2 or both. Default setting is Both RIP1and RIP2.

Display Routing Table (Entries) - Allows administrator to delete routing information.
This displays the current manual additions to the routing table.

Click [Add route] to enter new routing rule.



Add Routing Table Entry

- **Destination address** - Network IP address and subnet mask.
- **Gateway** - Address through which the packet passes before it reaches the destination address.
- **Metric** - Number of bridges (1-15) to be passed before the packet reaches its destination.

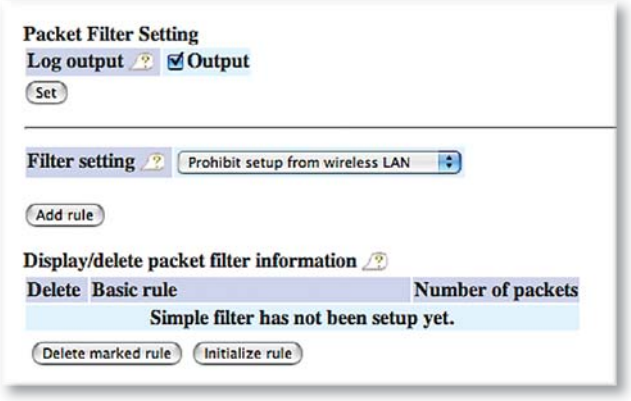
4.2.2 Packet Filter - This feature does not function on the AirStation Compact Repeater Bridge

Log Output - Activates the packet filter log.

Filter setting - Choose type from pull-down menu.

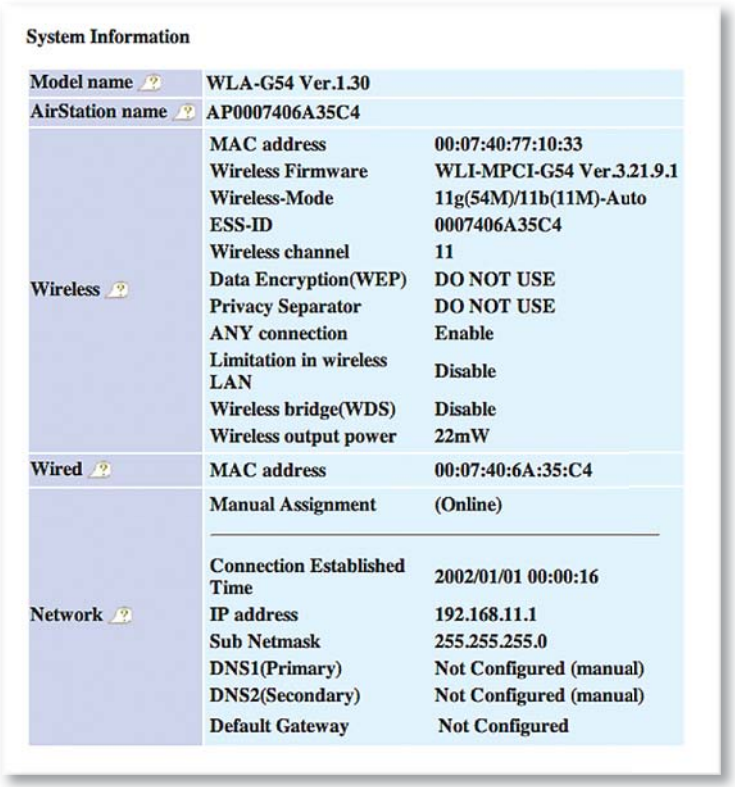
For **Manual setting**:

- **Operation** - Packets from LAN, select **ignored, rejected**, or **accepted**.

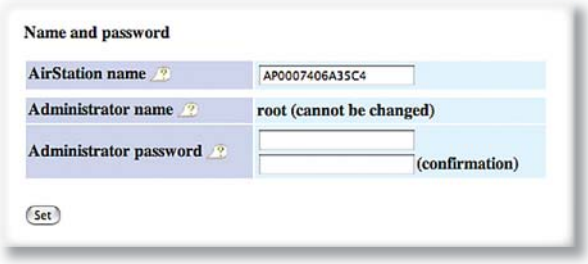


NOTE: This feature does not function on the AirStation Compact Repeater Bridge

4.3 Management (Network Diagnosis Settings)



4.3.1 System information - Displays System Settings and information including wireless MAC Address needed for WDS mode.



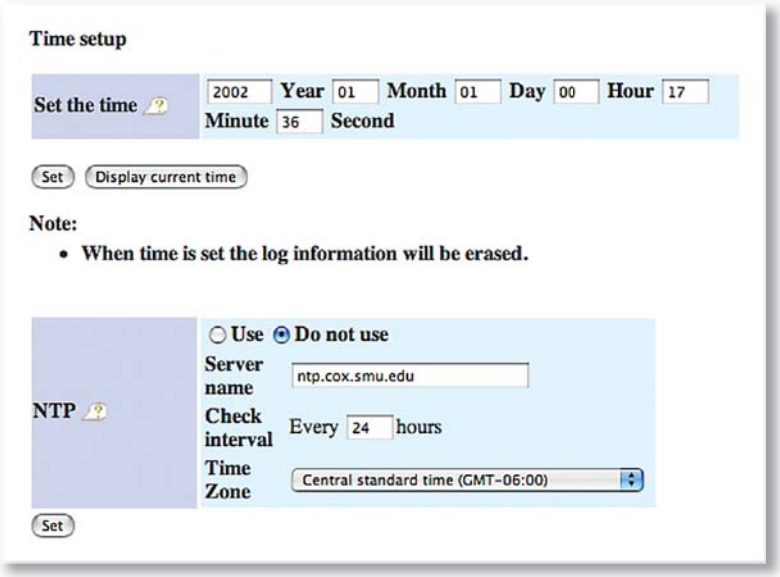
4.3.2 Name and Password

AirStation name - When using Client Manager and multiple AirStations, select a unique name to make it easier to identify each AirStation.

Administrator name - "root", cannot be changed

Administrator password - Allows the administrator to enter an administrator password to restrict access to the setting screens. Enter new password. Enter up to eight alphanumeric characters (case sensitive) and confirm password

If password is forgotten or misplaced, The WLA2-G54 can be returned to all the factory default settings by holding down the INIT button on the back of the unit for three seconds.



4.3.3 Time setup

Time setup - Enter the current date and time, and click **Set.**

NTP - Select **Use** or **Do not use.**

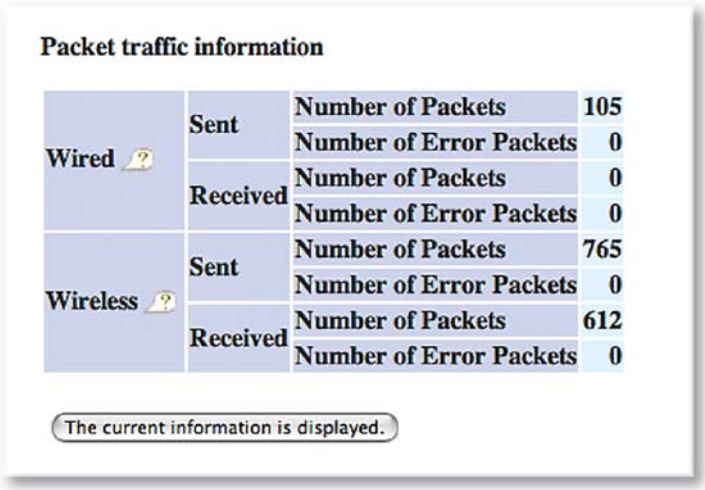
■ Note: If NTP is used, time is set automatically.

NTP server name - Enter the NTP server name

Check Interval - Enter the time interval for time check frequency

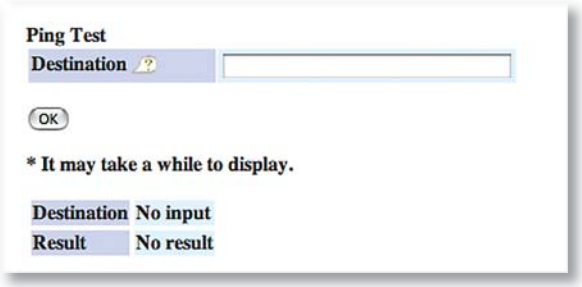
Time Zone - Select local time zone

Click **Set.**



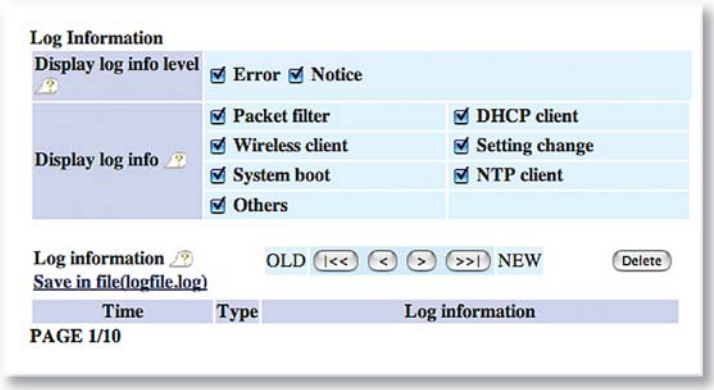
4.3.4 Transfer Packet Condition

Displays number of packets sent and received for wired WAN-LAN and wireless LAN traffic.



4.3.5 PING Test

Destination - Enter IP address for test and click **OK**

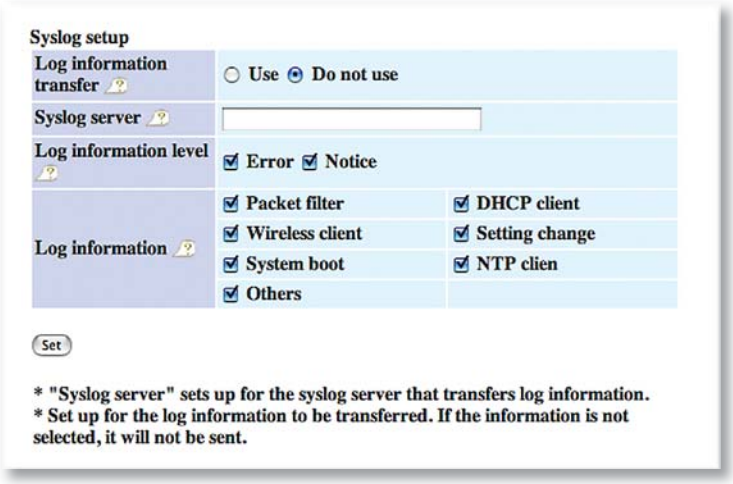


4.3.6 Log Information

Display log info level - Select **Error** and/or **Notify** to specify the types of reports to be logged by the AirStation.

Display log info - Select the specific reports to be logged.

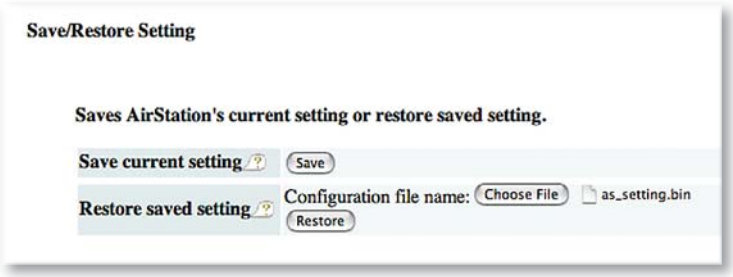
Log information - Displays recorded logs.



4.3.7 Syslog transmitting

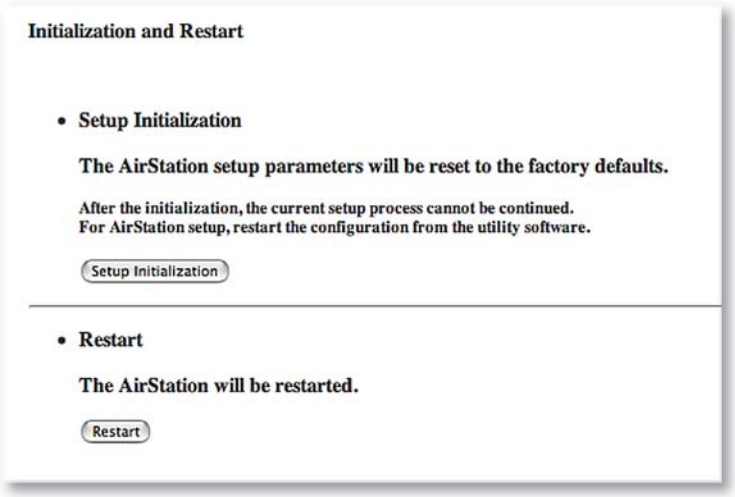
Select **Use** or **Do not use**

- **Syslog Server** - Enter the IP address of the Syslog server.
- **Log Information Level** - Select **Error** and/or **Notify** to specify the types of reports to be sent to the Syslog server.
- **Log Information** - Select the specific reports to be sent to the Syslog server.



4.3.8 Save/Restore

Initialization sets all parameters b



4.3.9 Initialization/Reboot

Initialization sets all parameters back to factory defaults. After initialization, the AirStation must be restarted.

4.4.10 Firmware Update

Firmware file name - Enter the path and filename for new firmware or select **Browse** to search for the path.

Click **Firmware Update** to load firmware to the AirStation.

■ Note: Firmware update does not erase current user settings.

■ Note: Firmware Updates can only be performed by the recommended Web Browsers below on the Macintosh.
OSX - The AirStation can be updated using Netscape v7 or Apple's Safari Web browser v1.0b2 or later.
OS9 - The AirStation can be updated using Netscape v5 or later or Internet Explorer 5.0 or later.

ADDITIONAL INFORMATION

Please check the Buffalo Web site for the latest information and any corrections made in this manual.

For more information, please consult one of the following:

- The **on-line help system** of your AirStation wireless system - for information about software and driver functionality.
- The AirStation website at **http://www.buffalotech.com** - for frequently asked questions (FAQ's) and Software Updates.

WLA2-G54 Specifications

Physical Specifications

Dimensions D58 x W120 xH 89 mm

Weight: 4.4oz (100 g)

Temperature & Humidity

Operation 0° to 35° C

Humidity: 20-80% (Non condensing)

Power Characteristics

Transmit Mode 1.1A (Nominal),

Power Supply 3.3 V

Regulatory Information A

Wireless communication is often subject to local radio regulations. Although AirStation wireless networking products have been designed for operation in the license-free 2.4 GHz band, local radio regulations may impose limitations on the use of wireless communication equipment.

Networking Characteristics Compatibility

- IEEE 802.11 Standard for Wireless LANs (DSSS)
- Wi-Fi (Wireless Fidelity) certified by the Wi-Fi Alliance.

Host Operating System

Microsoft Windows(r) ME/98/NT4.0/2000/XP, Unix/Linux/MacOS

Media Access Protocol

CSMD/CD

Radio Characteristics (Typical Indoor Ranges)

R-F Frequency Band 2.4 GHz (2400-2483 MHz)

11 selectable sub-channels

Modulation Technique Direct Sequence Spread Spectrum

- OFDM for High Transmit Rate
- CCK for High & Medium Transmit Rate
- DQPSK for Standard Transmit Rate
- DBPSK for Low Transmit Rate

Spreading 11-chip Barker Sequence

Bit Error Rate (BER) Better than 10 -5

Nominal Output Power 15 dBm (32mW)

Transmit Rate / Range

High Speed 54Mbps

Standard Speed 20 Mbps

Low Speed 1 Mbps

Open Office Environment

160 m (525 ft.)

270 m (885 ft.)

400 m (1300 ft.)

550 m (1750 ft.)

Semi-Open Office Environment

50 m (165 ft.)

70 m (230 ft.)

90 m (300 ft.)

115 m (375 ft.)

Closed Office

25 m (80 ft.)

35 m (115 ft.)

40 m (130 ft.)

50 m (165 ft.)

Receiver Sensitivity -69dBm, -72dBm, -77dBm, -81dBm, -85dBm, -88dBm -87dBm -90 dBm -92 dBm (depends on data rate)

Delay Spread (at FER of <1%) 65 ns 225 ns 400 ns 500 ns (depends on data rate)

- The range of wireless devices can be affected by metal surfaces, solid high-density materials and obstacles in the signal path.
- In Open Office environments, clients can "see" each other, i.e. there are no physical obstructions between them.
- In Semi-open Office environments, work space is separated by room dividers; client cards are at desktop level.
- In Closed Office environments, workspace is separated by floor-to-ceiling brick walls.

NOTE:

The range values listed in Table "Radio Characteristics" are typical distances as measured at Buffalo Technology AirStation laboratories. These values are provided for your guidance but may vary according to the actual radio conditions at the location where the AirStation product is installed.

AirStation IEEE 802.11 Channel Sets

The range of the wireless signal is related to the Transmit Rate of the wireless communication. Communications at a lower Transmit range may travel longer distances.

Center Channel ID FCC

1-2412	4-2427	7-2442	10-2457
2-2417	5-2432	8-2447	11-2462+
3-2422	6-2437	9-2452	

+ default channel

Hardware

Ports	One 10/100M port
Interface	IEEE802.03 (10Base-T/100Base-TX)
Access Method	CSMD/CD
Antenna Connector	Infrastructure/WDS
Antenna Connector	None
Security	Wi-Fi Protected Access™, AES, 802.1x, 128-bit WEP, password, MAC Address Registration, Privacy Separator, Dynamic Packet Filtering

B

Troubleshooting

B.1 Common Troubleshooting Tips B

Common Problems:

• Out of range, client cannot connect to the AirStation.

• Configuration mismatch, client cannot connect to the AirStation.

• Absence or conflict with the Client Driver.

• Conflict of another device with the AirStation hardware.

B.1.1 LED Activity B

Monitoring LED activity helps identify problems.

- Power LED should be GREEN,

- Wireless LED should be GREEN if the line is active. If is it blinking GREEN, wireless communication is active.

- Ethernet LED should be GREEN (100Mbps) or AMBER (10Mbps) while the communication is active.

Table B.1.1

LED Activity Table

If the LEDs indicate that the network is working properly (Power LED is on, Transmit/Receive LED blinks), check the TCP/IP settings of the network.

Changing Client TCP/IP Settings in your computer.

Consult the LAN Administrator for TCP/IP settings.

Windows

To add or change the TCP/IP Settings:

1. On the Windows task bar click Start.

2. Select Settings, then Control Panel.

3. Double-click on the Network icon to view the Network Properties.

4. From the list of installed components, verify the TCP/IP -> Buffalo WLI-PCI wireless LAN adapter protocol (or appropriate wireless LAN adapter) is installed.

• If this protocol is not yet installed, click the Add button and select the TCP/IP protocol from the list. Refer to Windows Help for more information.

• If this protocol is installed, select this protocol and click the Properties button. Verify the parameters match the settings provided by your LAN Administrator. Make changes if necessary, and click OK.

5. When prompted, restart your computer.

Macintosh OS9

1. Open the Control Panels

2. Double-click TCP/IP

3. Select Airport

3. Select DHCP or input static IP Address

Macintosh OS X

1. Open the System Preferences from your Dock

2. Click Network

3. Select Airport under Show

3. Select DHCP or input static IP Address

B. 1.3 Other Problems

Please refer to www.buffalotech.com for further reference materials or call Buffalo's Toll-Free Tech Support 24 hours a day, 7 days a week at 866-752-6210.

Glossary

10BaseT or 100BaseTx: 802.3 based Ethernet network that uses UTP (Unshielded twisted pair) cable and a star topology. 10 is 10 Mbps and 100 is 100 Mbps.

802.1x: The standard for wireless LAN authentication used between an AP and a client. 802.1x with EAP will initiate key handling.

Ad-Hoc Network: The wireless network based on a peer-to-peer communications session. Also referred to as AdHoc.

Bandwidth: The transmission capacity of a computer or a communication channel, stated in Megabits per second (Mbps).

BSS (Basic Service Set): An 802.11 networking framework that includes an .

Bus Mastering: A system in which the specified Input/Output device (e.g. NIC Card) can perform tasks without the intervention of the CPU.

Client: A PC or workstation on a network.

Default Gateway: The IP Address of either the nearest bridge or server for the LAN.

Default Parameter: Parameter set by the manufacturer.

Destination Address: The address portion of a packet that identifies the intended recipient station.

DNS (Domain Name System): System used to map readable machine names into IP addresses

Driver: Software that interfaces a computer with a specific hardware device.

DSSS (Direct Sequence Spread Spectrum): Method of spreading a wireless signal into wide frequency bandwidth.

DTE (Data Terminal Equipment): Device that controls data flowing to and from a computer.

Dynamic IP Address: An IP address that is automatically assigned to a client station in a TCP/IP network, typically by a DHCP server.

ESS (Extended Service Set): A set of two or more BSSs that form a single sub-network. ESS-ID is user identification used in the ESS LAN configuration.

Ethernet: The most widely used architecture for Local Area Networks (LANs). It is a shared-media network architecture. The IEEE 802.3 standard details its functionality.

Ethernet cable: A wire similar to telephone cable that carries signals between Ethernet devices.

File and Print Sharing: A Microsoft application that allows computers on a network to share files and printers.

Firmware: Programming inserted into programmable read-only memory, thus becoming a permanent part of a computing device.

Full-Duplex: To transmit on the same channel in both directions simultaneously.

Half-duplex: To transmit on the same channel in both directions, one direction at a time.

Hub: A device which allows connection of computers and other devices to form a LAN.

IEEE (Institute of Electrical and Electronics Engineers): The professional organization which promotes development of electronics technology.

IP (Internet Protocol) Address: A unique 32-binary-digit number that identifies each sender or receiver of information sent in packets.

Infrastructure: A wireless network or other small network in which the wireless network devices are made a part of the network through the .

ISP (Internet Service Provider): A company that provides access to the Internet and other related services.

IV (Initialization Vector): The header section of a message packet.

LAN (Local Area Network): A group of computers and peripheral devices connected to share resources.

LED (Light Emitting Diode): The lights on a hardware device representing the activity through the ports.

MAC (Medium Access Control) Address: A unique number that distinguishes network cards.

Mbps (Mega Bits Per Second): A measurement of millions of bits per second.

MHz (MegaHertz): One million cycles per second.

NAT (Network Address Translation): An internet standard that enables a LAN to use one set of IP addresses for internal traffic and a second set for external traffic.

NIC (Network Interface Card): An expansion card connected to a computer so the computer can be connected to a network.

Packet: A block of data that is transferred as a single unit, also called a frame or a block.

Packet Filtering: Discarding unwanted network traffic based on its originating address or its type.

Ping (Packet Internet Groper): An Internet utility used to determine whether a particular IP address is online.

Plug and Play: Hardware that, once installed ("plugged in"), can immediately be used ("played"), as opposed to hardware that requires manual configuration.

PoE (Power over Ethernet): A mechanism to send DC power to a device using a CAT5 Ethernet cable.

Protocol: A standard way of exchanging information between computers.

RADIUS (Remote Authentication Dial In User Service): A server that issues authentication key to clients.

Repeater Hub: A device that collects, strengthens and transmits information to all connected devices, allowing the network to be extended to accommodate additional workstations.

RC4: The encryption algorithm that is used in WEP.

RJ-45 connector: An 8-pin connector used between a twisted pair cable and a data transmission device.

Bridge: Device that can connect individual LANs and remote sites to a server.

Roaming: The ability to use a wireless device while moving from one to another without losing the connection.

SMTP (Simple Mail Transfer Protocol): The protocol used to define and deliver electronic mail (e-mail) from one location to another.

SNMP (Simple Network Management Protocol: An application layer protocol that outlines the formal structure for communication among network devices.

Static IP Address: A permanent IP address is assigned to a node in a TCP/IP network. Also known as global IP.

Subnet Mask: An eight-byte address divided into 4 parts separated by periods.

TCP/IP (Transmission Control Protocol/Internet Protocol: Protocol used by computers when communicating across the Internet or Intranet.

TKIP (Temporal Key Integrity Protocol): An encryption method replacing WEP. TKIP uses random IV and frequent key exchanges.

UDP (User Datagram Protocol): A communication method (protocol) that offers a limited amount of service when messages are exchanged between computers in a network. UDP is used as an alternative to TCP/IP.

Static IP Address: A permanent IP address is assigned to a node in a TCP/IP network. Also known as global IP.

Subnet Mask: An eight-byte address divided into 4 parts separated by periods.

WAN (Wide Area Network): A networking system covering a wide geographical area.

WEP (Wired Equivalent Privacy): An encryption method based on 64 or 128bit algorithm.

Web Browser: A software program that allows viewing of web pages.

Wi-Fi (Wireless Fidelity): An organization that tests and assures interoperability among WLAN devices.

Wire Speed: The maximum speed at which a given packet can be transferred using Ethernet and Fast Ethernet standard specifications.

WLAN (Wireless LAN): A LAN topology using wireless devices.

WPA (Wi-Fi Protected Access): An encryption method replacing WEP.

VPN (Virtual Private Network): A security method to connect remote LAN users to a corporate LAN system.

FCC/CE

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

R&TTE Compliance Statement

This equipment complies with all the requirements of the DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE). The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this manual and of the computer manufacturer must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries intended for use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France (with Frequency channel restrictions), Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Norway, The Netherlands, Portugal, Spain, Sweden, Switzerland and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Iceland, Liechtenstein, Norway and Switzerland.

EU Countries Not intended for use

None.

Potential restrictive use

France: Only channels 10,11,12, and13

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